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# DESCRIPTION

MESSAGE PROGRAM CONTROL METHOD, MESSAGE MACHINE  
USING THE METHOD, AND CONTROLLER FOR THE MESSAGE  
MACHINE

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## TECHNICAL FIELD

The present invention relates to a message machine for providing a message to a user according to a message program having a plurality of message stages with different message parameters.

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## BACKGROUND ART

Due to recent developments in control engineering, complex message actions such as acupuncture actions, kneading actions and combinations thereof have become possible in addition to a relatively simple message action such as tapping. By carrying out these message actions according to a predetermined program, high message effects have been obtained, which are comparable to them brought by skilled message therapists.

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For example, as this kind of message machine, Japanese Patent Early Publication [kokai] No. 6-327739 discloses a chair-type message machine with an automatic message course function. This message machine comprises a repetition unit for ordering the repetition of a desired message action during an execution of the message course, and a control unit for performing the message action ordered by the repetition unit again at that time. As a result, a degree of satisfaction of the user receiving the message course can be improved by quickly responding to the user's request.

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However, in this message machine, the repetition of the message action is available only in the executed message course. Therefore, it is needed to input the order for the repetition of the desired message action again at the next execution of the message course. This leads to an inconvenience of forcing the user in a relaxed state by the message to perform the same input operation

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every execution of the message course.

Thus, since the message course can not be modified to meet the user's preference in consideration of changes made every execution of the message course, the conventional message machine still has plenty of room for improvement.

#### SUMMARY OF THE INVENTION

Therefore, a concern of the present invention achieved for solving the above problem is to provide a message program control method for modifying a message program so as to meet a user's preference by reflecting a change in message parameter performed during an execution of the message program on the next execution of the message program.

That is, on the condition of using a message machine for providing a message according to a message program having a plurality of message stages with different message parameters, the message program control method of the present invention is characterized by comprising the steps of storing a change in message parameter performed in a desired message stage during an execution of the message program in a memory, and modifying the desired message stage according to the change in message parameter stored in the memory at the next execution of the message program.

According to the control method of the present invention, since the change in message parameter performed to meet the user's preference during the execution of a predetermined message program can be reflected on the subsequently performed message program, it is possible to modify the contents of the message program to meet the user's preference, without performing the same operation of changing the message parameter every execution of the message program.

In addition, when a change in total time required for the message program occurs due to the change in message parameter in the desired message stage, it is preferred to change a corresponding message parameter in another message stage other than the desired message stage such that the

message program is completed within a predetermined time period.

In this case, even when the message parameter, for example, the number of actions of a message applicator is changed in the desired message stage, the message program can be always completed within the required time period by adjusting the number of actions of the message applicator in another message stage.

Specifically, it is preferred that the memory comprises a memory table for storing a required number of message stages having a same message parameter, and when the desired message stage is stored in the memory table as a result of the change in message parameter, another message stage stored in a predetermined position in the memory table is deleted from the memory table, and the message parameter in the another message stage deleted from the memory table is changed such that the message program is completed within a predetermined time period.

As a further preferred embodiment of the present invention, the memory comprises a memory table for storing a required number of message stages having a same number of message actions. In this case, when the desired message stage is stored in the memory table as a result of a change in the number of message actions in the desired message stage, another message stage stored in a predetermined position in the memory table is deleted from the memory table, and the number of message actions in the another message stage deleted from the memory table is changed such that the message program is completed within a predetermined time period.

In addition, it is preferred that the message program comprises a plurality of message stages having a same message parameter, and when a change in message parameter performed in one of the message stages having the same message parameter is stored in the memory, the message stages having the same message parameters are modified in one lump according to the change in message parameter stored in the memory at the next execution of the message program.

In this case, it is possible to effectively provide the message program, while keeping the user in a relaxed state, without performing the operation of inputting the change in message parameter every execution of the message stage having the same message parameter.

5           Specifically, it is preferred that the message parameter comprises a combination of range of message action and at least one of the kind of message action, the number of message actions, message strength and message speed, and the message program comprises a plurality of message stages having a same range of message action. In this case, when a change in message  
10       parameter performed in one of the message stages having the same range of message action is stored in the memory, the message stages having the same range of message action are modified in one lump according to the change in message parameter stored in the memory at the next execution of the message program.

15           As a further preferred embodiment of the present invention, the message parameter comprises a combination of range of message action in a width direction, range of message action in a height direction, and at least one of the kind of message action, the number of message actions, message strength and message speed, and the message program comprises a plurality of  
20       message stages having at least one of a same range of message action in the width direction and a same range of message action in the height direction. In this case, when a change in message parameter performed in one of the plurality of message stages is stored in the memory, the message stages having at least one of the same range of message action in the width direction and the  
25       same range of message action in the height direction are modified in one lump according to the change in message parameter stored in the memory at the next execution of the message program.

          In addition, it is preferred that the message parameter comprises range of message action provided by a plurality of blocks, each of which is composed  
30       of a plurality of combinations of range of message action in a width direction

and range of massage action in a height direction. In this case, an optimum block is determined from the plurality of blocks according to a predetermined correlation between the range of massage action and body-type information, and the body-type information of a user to be massaged, and one of the plural combinations of the range of massage action in the width direction and the range of massage action in the height direction is determined in the optimum block to meet the user's preference.

In this invention, it is possible to prevent that the user mistakenly selects a range of massage action considerably deviated from an optimum range of massage action recommended from the body-type information of the user during the execution of the massage program. In addition, a comfortable massage effect can be provided to the user unskilled in the massage machine by a relatively simple operation.

A further concern of the present invention is to provide a massage machine using the control method described above. That is, this massage machine is characterized by comprising an input unit configured to input a change in massage parameter, first memory for temporarily storing the change in massage parameter input by the input unit in a desired massage stage during an execution of a massage program, second memory for storing the change in massage parameter provided from the first memory after the completion of the massage program, and a control unit for modifying the desired massage stage according to the change in massage parameter stored in the second memory at the next execution of the massage program.

Furthermore, another concern of the present invention is to provide a controller for the massage machine. That is, this controller is detachable to a massage machine comprising a first memory for temporarily storing a change in massage parameter in a desired massage stage during an execution of a massage program, second memory for storing the change in massage parameter provided from the first memory after the completion of the massage program, and a control unit for modifying the desired massage stage according to the

change in message parameter stored in the second memory at the next execution of the message program. The controller is characterized by comprising an input unit configured to input the change in message parameter, and a screen for displaying the message parameter.

5 Additional features of the present invention and effects brought thereby will be understood from the best mode for carrying out the invention described below.

#### BRIEF EXPLANATION OF THE DRAWINGS

FIG. 1 is a perspective view of a chair-type message machine according to an  
10 embodiment of the present invention;

FIG. 2 is an explanatory view for an action range of a message head of the message machine;

FIG. 3 is an example of a message program used in the message machine;

FIG. 4 is a front view of a controller for the message machine;

15 FIG. 5 is a block diagram of a control unit of the message machine;

FIG. 6 is a modification result of the message program of FIG. 3 according to a message program control method of the present invention;

FIGS. 7A and 7B are respectively another message program and a memory table available in the present message machine;

20 FIGS. 8A and 8B are modification results of the message program of FIG. 7A and the memory table of FIG. 7B according to another message program control method of the present invention;

FIG. 9 is a diagram showing a modification of the message machine of the above embodiment; and

25 FIG. 10 is an example of the message program used in the modification.

#### BEST MODE FOR CARRYING OUT THE INVENTION

Referring to the attached drawings, the present invention is explained in details according to preferred embodiments.

As shown in FIG. 1, a chair-type message machine according to an  
30 embodiment of the present invention comprises a seat portion 1, backrest

portion 2, and a leg support portion 3. Massage heads 4 are incorporated in the backrest portion 2, and can be driven by a drive mechanism (not shown). A structure of the drive mechanism is not limited on the condition that a required massage action can be provided through the massage heads 4. For example, a drive mechanism introduced in Japanese Patent Early Publication No. 6-327739 may be used. In this embodiment, the drive mechanism is configured such that any one of an acupuncture action, tapping action, kneading-up action and a kneading-down action can be selectively provided to the back of a user sitting on the seat portion 1 through the massage heads 4.

In the massage machine of this embodiment, as shown in FIG. 2, a desired action range ( $W_x, H_y$ ) of the massage heads 4 can be selected from total 72 ( $6 \times 12$ ) different action ranges. That is, the desired action range is determined by a combination of one of a plurality of action ranges ( $W_x, x = 1$  to 6) of the massage heads 4 in a width direction **W** of the backrest portion 2 and one of a plurality of action ranges ( $H_y = 1$  to 12) of the massage heads 4 in a height (up and down) direction **H** of the backrest portion 2. In this embodiment, as the values ( $x, y$ ) become larger, a larger action range of the massage heads 4 is obtained.

In the massage machine of this embodiment, the number of massage actions, a magnitude of load applied to the user through the massage heads 4 (hereinafter referred to "massage strength"), and massage speed can be changed as the massage parameter as well as the kind of massage action provided by the massage heads 4 and the action range ( $W_x, H_y$ ) of massage (the massage heads).

In the massage machine of the present embodiment, a massage program for providing a plurality of massage stage with different massage parameters in a predetermined order to the user is installed. The motion of the massage heads 4 based on this massage program is controlled by a control unit described later of the massage machine.

FIG. 3 shows an example of the massage program. This massage

program has 10 message stages. Each of the message stages is different from an adjacent message stage by one of the kind of message action provided by the message heads **4** and the ranges of message action (Wx, Hy). In this case, the number of message action (2 times), message strength (Level 3) and the message speed (Level 3) are respectively constant.

An input for changing the message parameter can be performed through a controller for the message machine shown in FIG. 4. This controller **5** is detachable to a main body of the message machine, and comprises a main power switch **10**, buttons **11** for changing the action range (Wx) of the message heads **4** in the width direction, buttons **12** for changing the action range (Hy) of the message heads **4** in the height direction, buttons **13** for changing the number of message actions, buttons **14** for changing the message strength, buttons **15** for changing the message speed, buttons **16** for selecting the message program, user identification buttons **17** for reading out the message program stored in association with the individual user, and a display **18** for displaying the contents of the message program. The controller of FIG. 4 is an example. If necessary, the number of buttons for changing the message parameters may be reduced, or buttons for changing another message parameter such as the kind of the message action provided by the message heads **4** may be added.

As shown in FIG. 5, the control unit **6** of the message machine of this embodiment comprises a processor **20** composed of MPU and a memory provided with RAM **21** and EEPROM **22**. During the execution of the message program, when a change in message parameter is input from the controller **5** in a desired message stage, it is temporarily stored in the RAM **21**. According to the change in message parameter performed during the execution of the message program, the message program in progress is changed, and the information about the change in the message parameter stored in the RAM is stored in the EEPROM **22**. When the message program is performed next time, the control unit **6** modifies the message program according to the information



about the change in message parameter stored in the EEPROM 22. Therefore, the user is only needed to push the user identification button 17 to select the message program for the user, so that a modified message program based on the change in message parameter performed last time is provided to the user.

5 In addition, when the above operation of changing the message parameter is performed plural times, it is possible to efficiently obtain the message program to meet the user's preference.

When the user changes a message parameter in the desired message stage, the message machine of this embodiment has a function of changing the  
10 message parameter in one lump with respect to the desired message stage and another message stage(s) having the same message parameter at the next execution of the message program.

For example, when the number of message actions in the message stage No. 1 is changed from 2 times to 3 times during the execution of the message  
15 program of FIG. 3 by use of the message machine, the number of message actions in the message stage No. 5, which has the same action range (W3, H4) of the message heads and the same kind of message action (acupressure) as them of the message stage No. 1, is also changed from 2 times to 3 times in one lump. A modified message program obtained by modifying the message  
20 program of FIG. 3 according to this control method is shown in FIG. 6.

In addition, when at least one of the action range of the message heads and the kind of message action in another message stage is equal to the message parameter of the message stage No. 1, the another message stage may be modified in one lump. The message parameter other than the number of  
25 message actions can be changed in one lump in a similar manner to the above. By the way, the present control method is characterized by changing the message parameter in one lump at the next execution of the message program according to the change in message parameter performed in the last execution of the message program. Alternatively, the message stages of the message  
30 program in progress may be modified in one lump.

By using the above function, it is not needed for the user to change the message parameter every execution of the message stage having the same or similar message parameter. Therefore, the user can receive the message program under a more relaxed condition. As a result, there is an advantage  
 5 that the message program can be more effectively provided to the user.

In addition, when an increase or decrease in total time required for the message program is caused by the change in message parameter, the message machine of the present embodiment has a function of automatically adjusting the message program such that the message program is completed within a  
 10 predetermined time period.

The following explanation is useful to understand this control function. For example, a message program shown in FIG. 7A is set, and a memory table having the capability of storing three message stages at the maximum is formed, as shown in FIG. 7B. On the condition that the number of message actions is  
 15 3 times, only the kind of message action and the ranges of message actions are stored in the memory table. That is, in the memory table of FIG. 7, the message stage No. 1 is stored in the memory No. 1, the message stage No. 4 is stored in the memory No. 2, and the message stage No. 9 is stored in the memory No. 3.

For example, as shown in FIG. 8A, when the user changes the number of message actions in the message stage No. 6 from 2 times to 3 times, it means that the time period needed to complete the message program is extended by an increase in the total number of the message stages having the number of message actions (3 times). In this case, as shown in FIG. 8A, the control unit  
 20 deletes the message stage No. 3 stored in the memory No. 1 from the memory table, and also decreases the number of message actions in the message stage No. 3 from 3 times to 2 times. In addition, the message stages No. 4 and No. 9 are respectively moved forward to the memory No. 1 and No. 2, and stored therein. On the other hand, the message stage No. 6 having the changed  
 25 message parameter, i.e., the number (3 times) of message actions, is newly  
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stored in the memory No. 3 of the memory table.

Thus, the change in message parameter is deleted in order of occurrence, and the total number of the message stages with an increase in the number of message actions is limited. In addition, the number of message actions changeable in each of the message stages is also limited. Therefore, even when the user increases the number of message actions in the desired message stage during the execution of the message program, the total time required to complete the message program can be maintained in a predetermined time period by decreasing the number of message actions in another message stage. Of course, when the user decreases the number of message action in the desired message stage of the message program, the total time required to complete the message program can be maintained in the predetermined time period by increasing the number of message actions in another message stage.

In the past, it has been proposed to monitor the execution time of the message program by use of a timer, and forcibly finish the message program when the execution time reaches a predetermined time period. However, in such a control method, there is a fear that the message program in progress is stopped on the way as a result of a change in message parameter before the completion of the final message stage. In this case, a comfortable message effect can not be sufficiently achieved. On the contrary, according to the control method of the present invention, even when the message parameter is changed, it is possible to complete the message program within the required time period, and therefore stably provide the comfortable message program to the user.

As a modification of the message machine of this embodiment, it is preferred that an optimum one of a plurality of combinations of the range of message action in the width direction and the range of message action in the height direction can be selected according to an input of body-type information peculiar to the user.

For example, as shown in FIG. 9, 18 blocks (B1 to B18) are provided, each of which is composed of a set of four different action ranges (Wx, Hy) of the message heads 4 of FIG. 2. Based on a previously prepared correlation between the action range of the message heads and the body-type information such as body height and body weight, and the body-type information of the user to be massaged, a recommended block is determined from the 18 blocks in each of the message stages, and displayed on the display 18 of the controller 5. Next, a favorite one of the four action ranges (Wx, Hy) in the recommended block is selected by the user. Therefore, it is possible to avoid a situation that the user mistakenly selects the message action that is not adequate for the user during the execution of the message program. FIG. 10 is an example of the message program having recommended blocks for the respective message stages.

In the case of inputting the body-type information of the user, a body-height input portion (not shown) for inputting a body height of the user may be formed in the controller. Alternatively, the body-type information of the user may be collected by setting positions of the message heads at the shoulder position of the user sitting on the message machine, and then pushing a reset button (not shown).

## 20 INDUSTRIAL APPLICABILITY

As described above, according to the present invention, since the message program can be modified to meet the user's preference by reflecting a change in message parameter input during an execution of the message program on the next execution of the message program, it is possible to provide a more comfortable message effect to an individual user, as compared with the case of repeatedly providing a predetermined message program. In addition, it is not needed to change the message parameter every execution of the message program. Therefore, even when the user is senior citizen or not be good at operating the message machine, there is an advantage that a desired message effect can be readily obtained without a complex setting operation.